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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/674,268	09/29/2003	Michael Fantuzzi	33503/US	3101

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EXAMINER	
KOSSON, ROSANNE	
ART UNIT	PAPER NUMBER
1652	

MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/674,268	FANTUZZI, MICHAEL	
	Examiner	Art Unit	
	Rosanne Kosson	1652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *October 19 and 20, 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *14,15,18-20,22,23,32-34,36-43 and 45-51* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *14,15,18-20,22,23,32-34,36-43 and 45-51* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *10/20/09*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

The amendment filed on October 19, 2009 has been received and entered. Claims 14 and 22 have been amended. Claims 1-13, 16, 17, 21, 24-31, 35 and 44 were canceled in previous Office actions. No claims have been added. Accordingly, claims 14, 15, 18-20, 22, 23, 32-34, 36-43 and 45-51 are examined on the merits herewith.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 103

Claims 14, 15, 18, 22, 23, 32-34, 36, 42, 43, 45 and 46 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Soft Gel Technologies, Inc. (EP 888774) in view of Garti et al. (US 2003/0232095 A1), Elstner (WO 02/09685 A1 or English language equivalent US 2004/0047922 A1) and RITO Partnership (Rice Bran Oil Info, http://web.archive.org/web/20020809203831/http://www.ricebranoil.info/why/index.html, web page of Aug. 9, 2002, printed from the Internet on April 29, 2009). This rejection has been discussed in the previous Office actions.

To reiterate, Soft Gel discloses a soft gel (soft gelatin capsule) comprising co Q10 dissolved in rice bran oil and Vitamin E, another oil that is a tocopherol and an anti-oxidant. Thus, Soft Gel teaches a solution of co Q10 in two carriers that are oils. The three components are mixed before encapsulation so that soft gel capsules containing 30 mg of coQ 10 and 30 IU of vitamin E are produced (see p. 2, lines 5-7 and 51-52; and p. 3, lines 4-5). When coQ 10 is dissolved in a plant oil, the bioavailability is improved over a dry formulation, as shown by increased blood levels of coQ 10 in subjects receiving the soft gel capsules (see p. 2, lines 31-

45; p. 3, lines 4-6; p. 3, line 54, to p. 4, line 16; and Tables I and II). Soft Gel does not disclose dissolving the co Q in d-limonene.

Garti et al. disclose compositions, nano-scale emulsions, comprising co Q10 dissolved in d-limonene (see paragraphs 10-16, 29 and 40-42 and claim 9; d-limonene, (R)-limonene and (+)-limonene are synonyms). These compositions are nutritional supplements whose absorption by the body and bioavailability are better than those of solid dosage forms (see paragraphs 3-7). The advantage of these formulations is that they are stable and can be diluted in either oil or water while maintaining their structure (see paragraphs 10-16, 29, 30 and 40-42). The working examples of Garti et al. (see pp. 5-7) suggest that d-limonene is the preferred solvent among the large number of aromatic fruit and vegetable oils listed as solvents for lipophilic neutraceuticals in the aforementioned paragraphs. Thus, the idea of dissolving co Q10 in limonene (d-limonene) is not novel to Applicant, as is it is disclosed by Garti et al. It would have been obvious to one of ordinary skill in the art at the time of the invention to replace the rice bran oil of Soft Gel with the d-limonene of Garti et al., because Garti et al. disclose that d-limonene is solvent for co Q10 that may be used in a nutraceutical formulation to deliver more co Q10 to the body. Garti et al. teach the functional equivalence of the two solvents. It is obvious to dissolve a compound in a solvent in which it is known to be soluble.

Moreover, RITO Partnership discloses that the main components of rice bran oil are palmitic, linoleic and linolenic acids (see Table 1). Garti et al. disclose that additional solvents for co Q10 are fatty acids of 2-24 carbons (see, e.g., paragraphs 16 and 29). Thus, Garti et al. teach the equivalence of d-limonene and long chain fatty acids as solvents for co Q10.

Further, Elstner discloses a nutraceutical composition comprising co Q10 dissolved in a mixture of γ-terpinene (an isomer of d-limonene derived from lemon oil, limonene being derived from orange oil) and vitamin E (alpha-tocopherol). Elstner discloses that vitamin E improves the

anti-oxidant effect of the co Q10 and that his composition has an unexpected synergistic effect as an antioxidant in the circulatory system (see p. 3, line 24, to p. 5, line 15 of the PCT application or paragraphs 11-18 of the US application). As Elstner teaches dissolving co Q10 in a mixture of γ-terpinene (an isomer of d-limonene) and vitamin E, the artisan of ordinary skill would have expected co Q10 to be soluble in a mixture of d-limonene and vitamin E.

Regarding claims 18, 32-34, 36, 42, 43, 45 and 46, which recite the amount of dissolved co Q10 in the soft gel as a % by weight, Garti et al. do not disclose the solubility limit of co Q10 in d-limonene. They disclose that, in the concentrated form of their composition, the oil phase contains 2.45% co Q10 and 17.22% d-limonene, as percentages of the whole (see paragraph 40). But, the ranges recited in the claims do not appear to be associated with any particular result or effect. It would have been obvious to one of ordinary skill in the art at the time of the invention to dissolve as much co Q10 as possible in the d-limonene and in the solvent mixture of limonene and vitamin E, in order to make the most concentrated preparation possible, in order to deliver as much co Q10 as possible to the body. The solubility limit of co Q10 in any solvent or solvent mixture would have been readily determined by the artisan of ordinary skill, such a determination being routine in the art. The maximum solubility of a compound in a solvent or solvent mixture is an inherent property of that liquid.

Regarding claim 22 and its dependent claims, which recite a neutraceutical composition packaged with instructions, because the composition of Soft Gel is a neutraceutical, it would have been obvious to the artisan of ordinary skill at the time of the invention to package it for sale as neutraceutical, along with instructions for its use.

Applicant asserts that the claimed invention is not obvious, because Garti et al. disclose an emulsion containing a surfactant, while the claims recite a solution and exclude an emulsion,

a suspension and an elixir. In reply, first, the amendment to the claims does not change the claims in any substantial way. If the co Q10 is solubilized in the limonene (which is not part of the amendment), the resulting product is a solution, not a suspension. Moreover, this solution cannot be an emulsion, an oil-in-water or a water-in-oil emulsion, because the aqueous phase would dissolve the gelatin that is the soft gel. Also, as shown in the reference filed with Applicant's most recent IDS, an elixir is a medicinal concoction that has no particular structure at all. Second, as discussed in the previous Office actions, Garti et al. were cited for their teaching that d-limonene is a solvent for co Q10. Garti et al. disclose that the purpose of their work was to make a stable, concentrated emulsion of co Q10 that could be diluted either in water or in an oil (see paragraphs 10 and 17). Thus, the artisan of ordinary skill would have known that the hydrophilic phase (ethanol) and the surfactant/emulsifier (Tween 80) were used to make the emulsion, not to assist in dissolving the co Q10. The artisan of ordinary skill would have known that co Q10 is insoluble in ethanol and that Tween is a conventional surfactant.

Applicant asserts that the claimed invention is not obvious for the reason that the omission of an element with the retention of the element's function is an indicium of unobviousness. In reply, such is not Applicant's fact pattern. The instant invention lacks no elements with the retention of a function. As discussed above, Garti et al. teach that d-limonene is a solvent for co Q10 and that it is the oil phase in the emulsion. Ethanol (or ethanol and water) is/are the hydrophilic phase, and Tween 80 is the emulsifier. This argument does not serve to overcome the rejection.

Applicant asserts that Garti et al. teach away from the instant invention, because they teach an emulsion of co Q10, not a solution. In reply, as discussed previously and above, Garti et al. were cited for their teaching that d-limonene is a solvent for co Q10 and the preferred solvent in a large group of solvents that are plant oils (fruit, vegetable and herb oils) (see

paragraphs 16, 29 and 40-42). The rejection is one of obviousness, not anticipation; the invention of Garti et al. is different from Applicant's, as it is a different formulation of co Q10; and Garti et al. simply had a different purpose for their invention. But, particularly because it was known at the time of the invention to make a co-Q10-containing soft gel nutraceutical by dissolving the co Q10 in a plant oil and using that as the filler (as taught by Soft Gel), the information provided by Garti et al. is not a teaching away. Garti et al. teach additional solvents for co Q10.

In view of the foregoing, a holding of obviousness is again required.

Claims 19, 20, 37-41, and 47-51 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Soft Gel Technologies, Inc. (EP 888774) in view of Garti et al. (US 2003/0232095 A1), Davidson et al. (US 2004/0001874) and Elstner (WO 02/09685 A1 or English language equivalent US 2004/0047922 A1). This rejection was discussed in the previous Office action.

To reiterate, the teachings of Soft Gel, Garti et al. and Elstner are discussed above. The idea of dissolving co Q10 in limonene (d-limonene) is not novel to Applicant, as is it is disclosed by Garti et al. It would have been obvious to one of ordinary skill in the art at the time that the invention was made to add d-limonene to the composition of Soft Gel, to make a three-part solvent of d-limonene, vitamin E and rice bran oil for the co Q10, rather than the two-part solvent disclosed by Soft Gel (rice bran oil and vitamin E, rice bran oil being the carrier), because Garti et al. disclose that d-limonene is a solvent for the co Q10 and a preferred solvent compared to other fruit and vegetable oils. Thus, the artisan of ordinary skill would have had every expectation of success in dissolving co Q10 is this three-solvent mixture. It would have been obvious to one of ordinary skill in the art at the time of the invention to supplement the soft

gel fill of Soft Gel by adding d-limonene, because Garti et al. disclose that co Q10 is soluble in d-limonene, and it is obvious to dissolve a compound in a solvent in which it is known to be soluble. Garti et al. disclose of number of solvents for co Q10, while Soft Gel discloses the solvents rice bran oil, vitamin E and soybean oil. Optimization of solvent mixtures for a particular compound (e.g., to achieve maximum solubility or other desirable properties) was conventional and routine in the art at the time of the invention. Further, as Elstner teaches dissolving co Q10 in a mixture of γ-terpinene (an isomer of d-limonene) and vitamin E, the artisan of ordinary skill would have expected co Q10 to be soluble in a mixture of d-limonene and vitamin E.

Additionally, under the doctrine of In re: Kerkhoven, it would have been obvious to one of ordinary skill in the art to combine solvents in which co Q10 is known to be soluble, i.e., d-limonene, rice bran oil and vitamin E, to prepare a solution of co Q10 in this solvent mixture, because each solvent has been shown in the prior art to be particularly effective for delivering co Q10 to cells in humans. It is *prima facie* obvious to combine two or more compositions each of which is taught by the prior art to be useful for the same purpose in order to form a third composition that is to be used for the very same purpose, as the idea of combining them flows logically from their having been individually taught in the prior art (see MPEP 2144.06). One of ordinary skill in the art would have reasonably expected to have been able to combine the solvent mixture of Soft Gel with the solvent of Garti et al. to produce a co Q10 solution with improved bioavailability, because both have been demonstrated in the prior art to work for this purpose. Thus, the combination of the teachings of Garti et al. and Soft Gel with respect to preparing solutions of co Q10 is an obvious combination.

Davidson et al. disclose soft gel capsules containing fish oil into which coQ 10 is blended. Fish oil reduces serum triglyceride levels and reduces the incidence of death from

cardiovascular disease. Patients with cardiovascular disease often take statin drugs, which deplete the body's coQ 10, thereby causing muscle toxicity (myopathy) (see paragraphs 55 and 57). The soft gel capsules of Davidson et al. replenish the coQ 10 in the body and also treat hypertriglyceridemia. It would have been obvious to one of ordinary skill in the art at the time of the invention to add fish oil to the contents of the soft gel of Soft Gel, to add an extra neutraceutical ingredient, because Davidson et al. disclose that soft gels containing co Q10 and fish oil can both treat high triglyceride levels and provide coQ 10 to humans. Moreover, the artisan of ordinary skill would have expected the co Q10 to be soluble in the fish oil (as co Q10 is a very lipophilic compound that is insoluble in water and hydrophilic solvents but soluble in oils), and he would have expected the fish oil to be miscible with the d-limonene and a lipophilic carrier, such as rice bran oil.

Regarding claim 47 and its dependent claims, which recite a neutraceutical composition packaged with instructions, because the composition of Soft Gel is a neutraceutical, it would have been obvious to the artisan of ordinary skill at the time of the invention to package it for sale as neutraceutical, along with instructions for its use.

Applicant asserts that the claimed invention is not obvious, because claims 14 and 22 do not recite a solvent mixture. Applicant asserts that Garti et al. do not disclose that co Q10 is soluble in limonene, because they disclose emulsions. Applicant asserts that Elstner does not teach that co Q10 is soluble in limonene or in a mixture of γ-terpinene and vitamin E and that none of the other references teach that co Q10 is soluble in limonene.

In reply, claims 14 and 22 are rejected in the previous section, not in this section. As previously discussed, this section applies to the claims that recite that the claimed soft gel further comprises a carrier, such as rice bran oil, with or without vitamin E. To reiterate, it would

have been obvious to combine the co Q10 solution taught by Garti et al. (co Q10 dissolved in d-limonene) with the co Q10 solution taught by Soft Gel (co Q10 dissolved in rice bran oil and vitamin E) under the doctrine of In re: Kerkhoven. Under this doctrine, it is considered obvious to combine two things, each of which has been taught for a particular purpose, to make a third thing that has the same purpose. Regarding Applicant's second point, Garti et al., this point is addressed above.

Regarding Elstner et al. and the remaining references, it is clear in the previous Office actions that the remaining references were cited for various reasons, but not for teaching a solution of co Q10 in d-limonene. As previously discussed, Elstner discloses a solution of co Q10 in a mixture of γ-terpinene (an isomer of d-limonene) and vitamin E. Thus, the artisan of ordinary skill would have expected co Q10 to be soluble in a mixture of d-limonene and vitamin E. Applicant disputes that this preparation is a solution, but γ-terpinene and vitamin E are oils in which co Q10 is soluble. As a result, the artisan of ordinary skill would have expected a solution, not a suspension. Additionally, the artisan of ordinary skill would have known that a suspension would not have been useful as a therapeutic preparation, while a solution would have been (from the points of view of uniform dose control and the ability to formulate the preparation as something that is easy to consume, e.g., a soft gel or a flavored liquid).

In view of the foregoing, a holding of obviousness is again required.

No claim is allowed.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rosanne Kosson whose telephone number is (571)272-2923. The examiner can normally be reached on Mon., Thurs., Fri., 8:30-6:00, Tues., 8:30-2:00, Wed. off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Wang, can be reached on 571-272-0811. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Rosanne Kosson
Examiner, Art Unit 1652
rk/2009-11-13

/Karen Cochrane Carlson/

Primary Examiner, Art Unit 1656